

City of San Diego

Science and Technology Economic Prosperity (STEP) Forum

April 15, 2004

Summary Report

Prepared by

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Table of Contents

Members of the City of San Diego Science & Technology Commission - 2

- 1. Executive Summary - 4**
- 2. STEP Forum Purpose - 5**
- 3. Technology Cluster Background - 6**
- 4. Forum Results: Priorities for Action - 8**
 - 4.1 Talent Squeeze: A Constraint to Growth - 8**
 - 4.2 Transportation Constraints: Productivity and Quality-of-life Concerns - 10**
 - 4.3 Business Uncertainty: Government Regulations and Processes - 12**
 - 4.4 Regional Perceptions: Science and Technology - 14**
- 5. What the City of San Diego Can Do - 16**
- 6. Conclusion - 19**

Appendix A – STEP Forum Attendees – April 15, 2004 - 20

Appendix B – Opportunities for Civic Entrepreneurs: The Importance of Regional Stewardship - 28

Appendix C – SANDAG Report - Science and Technology: The Key to Creating Prosperity - 29

1. Executive Summary

The City of San Diego Science & Technology Commission convened a group of 40 civic leaders representing San Diego's technology industry in the Science and Technology for Economic Prosperity (STEP) Forum on April 15, 2004. The purposes of the Forum were to share information about the impact of technology industries on the San Diego economy and regional economy, to discuss opportunities, issues and impediments that impact the growth of these industries, and to identify industry priorities to determine what policy actions might ensure that technology industries thrive in the city and region.

The San Diego Association of Governments (SANDAG) presented a briefing paper entitled Science and Technology: The Key to Creating Prosperity summarizing data on the economic impact of the technology clusters on the City and the region. Impediments to the growth of San Diego technology industries were then reviewed and prioritized by all participants. A number of excellent recommended actions were made addressing these impediments.

The issues identified as most significant in impeding technology industry growth in San Diego included: recruiting talent, enhancing education, dealing with housing affordability, improving transportation and land use, injecting certainty in the regulatory process, and recognizing the economic contribution of the technology industries to the region.

2. STEP Forum Purpose

As a result of the impact of the local technology industries on the region's economy and the rapid evolution of technology marketplaces, the San Diego City Council established the San Diego Science and Technology Commission (S&TC) in May 2000. The S&TC is a conduit for the technology industry to inform and interact with local government and provides a representative voice for technology stakeholders in the policy process. The Commission works with the City's Community and Economic Development Department (C&ED) and local technology industry organizations, as well as the San Diego Regional Economic Development Corporation (EDC).

The Science and Technology Economic Prosperity (STEP) Forum was convened for the first time on April 15, 2004 by the S&TC with organizational support from C&ED, EDC, SANDAG and SDSU's College of Business. A list of Forum participants can be found in Appendix A. It is planned that similar forums will be held from time to time in the future.



Science and Technology for Economic Prosperity (STEP) Forum convened 40 civic leaders representing San Diego's technology industry on April 15, 2004.

STEP Forum Purpose

- **Share information about the impact of technology industries on the San Diego economy and regional economy.**
- **Discuss opportunities, issues and impediments that impact the growth of these industries.**
- **Identify industry priorities to determine what policy actions might ensure that technology industries thrive in the city and region.**

This summary report is based on three sources: economic and industry data, Forum discussion, and current or proposed City policy supporting the growth and expansion of local technology industries. Its purpose is to assist policy-makers to make informed decisions that support the growth of the region's technology industries.

3. Technology Cluster Background

The San Diego Association of Governments (SANDAG) prepared a briefing paper entitled Science and Technology: The Key to Creating Prosperity that was distributed to participants prior to the Forum. The briefing which is included in Appendix C provided hard data on the economic impact of the technology clusters, discussed cluster dynamics, as well as local policy issues that impact technology industries.

Michael Porter, Ph.D., of Harvard University studied San Diego as a region of innovation and made the important distinction between “traded clusters” and “local clusters.” “Local clusters are found everywhere and produce goods and services which are needed by the local population. Traded clusters produce goods in a particular locale and then distribute that product across the nation or globe. These clusters are concentrated only in a handful of regions.” All of San Diego’s technology industries are traded clusters.

Key points about the importance of traded technology clusters to the region’s economy are as follows:

San Diego competes with other regions for firms in traded clusters.

Companies in these clusters sell their goods and services to customers that are largely located *outside* of San Diego. Consequently, these firms have a large number of options when it comes to the location in which they will grow and expand. This forces San Diego to compete with other communities for the jobs these companies create.

Traded clusters provide opportunity for a rising standard of living.

Most of the traded clusters in our local economy are made up of firms that are innovative, add significant value in the production process, and/or have a highly productive and skilled workforce. As a result, these firms typically create jobs that pay significantly more than the region's present median wage. The average annual wage in the traded technology clusters ranges from \$49,000 to \$92,000 per employee. These wages are 40 percent to 160 percent above the \$34,606 average annual wage for all jobs in the region. The average annual *real* wage for all technology clusters increased from \$57,000 in 1995 to \$71,000 in 2002, when adjusted for inflation. This translates into a higher standard of living not only for the employees in the traded clusters but other San Diegans that benefit from increased regional spending.

San Diego's Seven Major Technology Clusters

- **Biomedical products**
- **Biotechnology and pharmaceuticals**
- **Communications**
- **Computer and electronics manufacturing**
- **Defense and transportation manufacturing**
- **Environmental technology**
- **Software and computer technology**

The San Diego region has strong potential for traded technology cluster growth.

The region has all the characteristics necessary for traded technology cluster success: excellent education and training facilities, world-class research institutions, and a skilled workforce.

The City of San Diego is a prime location for traded technology clusters.

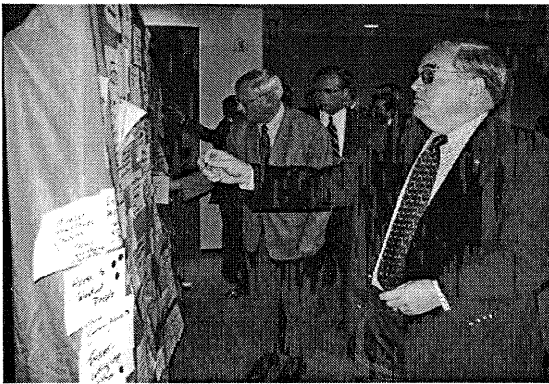
Employment in these traded technology clusters grew 25 percent between 1995 and 2002. In 2002, they provided more than 119,000 jobs. The number of technology firms grew more than 67 percent between 1995 and 2002, while the population of the region grew only 10 percent over the same time period. The City of San Diego contains approximately 80 percent of the total regional technology cluster employment.

4. Forum Results: Priorities for Action

More than 40 representatives from regional technology companies and higher education participated in the STEP Forum. The participants were asked to identify regional factors that would affect their future growth and discuss actions that would help their companies thrive in San Diego. This summary report addresses the major priorities among these regional factors which are discussed in the following subsections.

Major Priorities

- Addressing the growing talent squeeze and providing affordable housing
- Dealing with quality-of-life issues: transportation and education
- Streamlining government processes
- Building the visibility and influence of the technology industries locally and globally



After vetting a wide range of issues, participants were asked to prioritize the major concerns. Mr. Rod Lanthorne – Kyocera International chooses among priorities.

In addition, at the conclusion of the Forum, participants were asked how to initiate civic entrepreneurship to put into action some of the good ideas recommended at the Forum. The results of this inquiry are summarized in Appendix B.

4.1 Talent Squeeze: A Constraint to Growth

A top priority identified by Forum participants is the region's ability to meet growing employment needs for high-level technical talent. San Diego has a tremendously strong technical workforce today, but the concerns raised included both preparing current San Diegans to meet technology industry needs and attracting more top talent to the region.

As clusters expand, these concerns become a major barrier to future employment growth within the city and region. Modern advances in communications technology make linking geographically separate operations seamless. Absent an ability to successfully fill positions in San Diego, firms in these clusters can easily bias future investment toward other regions. Indeed, several homegrown San Diego companies have opened operations in areas like Raleigh, North Carolina, Boston, Massachusetts, and Austin, Texas, largely

as a response to labor force shortfalls in San Diego. San Diego is at real risk of seeing a slowdown in high-wage job growth if it does not address these workforce issues.

According to one participant, “The biotech industry has had to recruit manufacturing people from Europe, Irvine, Riverside; these folks are not available in San Diego.”

Colleges and universities are key in maintaining a growing technical talent pool and in continuing to provide intellectual stimulation and offering “life-long learning.” Lower-level technical workers are available offshore, but it is the high-level talent that must be grown here to support our technology clusters. In addition:

- Local colleges and universities need to be encouraged to grow talent for the region the way that Stanford and UC Berkeley have for Silicon Valley. Community colleges need to know employers’ requirements by specific occupation so that adequate numbers of future workers are appropriately trained. Community colleges are currently planning new facilities to train workers in biotech, communications and software, but they need better data about what specific training is needed and they need assurances that trainees will be employed and retained by employers after they train them. Local government can help by ensuring that our universities and colleges can continue to expand to meet demand, and that their ability to educate students is not constrained by limitations on their physical plant.
- Our local universities and graduate schools must compete nationally to attract the brightest young minds. This is the talent that will eventually become the management of our local technology industries and will attract the capital to build these industries further. The founding of the UCSD Rady School of Management and the success of the SDSU School of Business have contributed greatly to improving our competitiveness for this young talent.
- Companies should collaborate with local universities to create internships that will familiarize talented students with local industry opportunities.

Housing is another major component of the talent squeeze. The cost of housing, especially for the first-time buyers and new residents at all salary levels, is a major barrier to attracting and retaining employees. High housing costs have made recruiting from other parts of the country even more challenging and have made it increasingly difficult to attract and retain mid- and high-level employees.

One participant remarked, “The imbalance is a problem: affordable housing is located south of I-8 and the jobs located north of I-8.”

Workforce Issues

“For defense industries, a pool of local technical talent with U.S. citizenship must be available. [our company] needs 1,400 of these workers.”

Technical Liaison to the President Major Defense Contractor

And another participant observed: “There is no shortage of applications for jobs in San Diego, but getting people here is a challenge. Six years ago it was easy to recruit people here. The quality-of-life here sold really well, but it’s a lot harder today.”

Recommendations to the City of San Diego

- The City must continue to invest in organizations that promote San Diego as a great place for technology people to work. Emphasis should be on “creating a buzz and excitement” about San Diego. Prospective employees also need to know that given the many employment opportunities in San Diego’s technology industries, if one job doesn’t work out, another will be available.
- Although Forum participants recognize the City of San Diego has little direct responsibility in the area of education, they expect city officials to understand technology industry concerns in education and to support educational priorities for the technology industries at state and federal levels.
- The City should host a website to facilitate technical job searches for people interested in coming to San Diego; people could post their resumes on the site and industry could use it as a means to help the recruiting process.



STEP Forum Leaders: Hank Cunningham, Director of Economic Development; Mayor Dick Murphy and Science & Technology Commission Chairperson Martha Dennis

- The City of San Diego has a critical role to play in increasing the supply of housing for technology industry employees and university employees, as well as the general population. Specifically:
- Local authorities should examine what they can do to put incentives in place to increase housing inventory.
- The City should give incentives to increase housing density including lower fees for those willing to build denser housing. This will result in the construction of more workforce housing at affordable levels which, in turn, will help to attract and retain talent.

4.2 Transportation Constraints: Productivity and Quality-of-life Concerns

The high cost of housing and its impact on San Diego's workforce is closely linked to the concerns expressed at the Forum about transportation congestion. Imbalances between housing demand and supply have resulted in pressure to develop raw land at the periphery of the region and beyond. While housing is somewhat more affordable in these areas, the result is increasingly long commutes and congestion on our region's roads and freeways, necessitating billions of dollars in transportation investment.

Forum participants were concerned about transportation as both a productivity and quality-of-life issue. Traffic congestion has a direct impact on the ability of workers to get to work, while the difficulties of getting to work diminish their quality-of-life. Forum participants agreed that both productivity and quality-of-life would be greatly improved by reducing commute times and traffic congestion.

In addition, participants also noted the importance of air transportation to continued success and growth of many of the region's traded clusters. To meet the demands of their customers and partners located throughout the world these firms need frequent and convenient air transportation links for both employees and cargo. A congested airport or one without convenient non-stop service to key destinations, will put San Diego at a competitive disadvantage when compared to regions with larger airports that have more flights to more locations. Participants believe that, over time, failure to address our region's air infrastructure challenges will lead to San Diego companies placing future expansion and investments in regions with better air transportation links.

Finally, participants indicated that links between San Diego and Baja California remained critical to the competitive position of several technology cluster firms, notably electronics companies with investment on both sides of the border.

Recommendations to the City of San Diego

- Public transportation needs to be linked to technology, education and research centers within the City such as Torrey Pines and Sorrento Mesa; the trolley link to San Diego State University is considered to be a very successful solution.
- The City needs to specifically address increasing traffic congestion in the Sorrento Mesa area.
- The City should allocate a percentage of the money it receives from TransNet's local streets and roads program to providing enhanced infrastructure and transit services in areas where traded industries cluster exist such as the UTC, Mira Mesa, Rancho Bernardo, and Kearny Mesa.
- The City should make better use of "smart traffic systems" to increase capacity on local streets and freeways and should explore "smart traffic" technologies being developed.

- Transportation system upgrades and public infrastructure investments are a priority in the older areas of the city where increased density would be an inducement for increased investment and development interest.
- The City's Planning Commission should make citywide recommendations to improve the jobs/housing balance.
- The City should be active in promoting the location of an international airport within the region's boundaries.
- The City needs to take an active role in educating the Airport Authority on the needs and concerns of science and technology industries.
- San Diego has a unique advantage in its proximity to Mexico and many local technology firms import from or have operations in Mexico. The free flow of goods and services at the border must be enhanced in order for these firms to remain competitive in the global market place and in order to capitalize on San Diego's unique advantage.
- Through its Land Use and Housing Committee, the Mayor's Task Force on Congestion Relief, and SANDAG, the City Council should continue supporting the regional transportation planning efforts called for in the TransNet ballot measure.

4.3 Business Uncertainty: Government Regulations and Processes

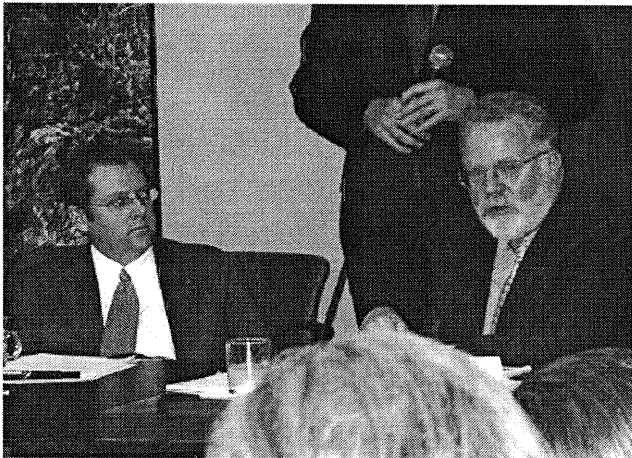
Difficulties with local regulatory and permitting processes were identified as significant concerns by the Forum. There was a general view that government should not try to "micro-manage" businesses through regulations but should focus on achieving positive outcomes together with business.

A Forum participant cautioned that government must recognize that San Diego is a hotbed for startups: "startups can't afford lawyers to help with regulations; we need to provide other resources to help them."

While the City has a number of regulatory relief efforts underway including CP 900-12, Business and Industry Policy and Development Services Forum, the Forum participants were generally unaware of them. However, most seemed to know that targeted technology industries are eligible for advocacy and permit-expediting assistance.

Recommendations to the City of San Diego

- The City should provide increased access to assistance for local firms in helping them understand regulations and in supporting their compliance with these regulations.
- The City should regularly bring together Development Services, C&ED, and industry representatives to systematically review regulatory processes and business support services that impact the technology industries.



Among the thought leaders expressing ideas and concerns were Curt Nelson, CEO of Silicon Space, a mid-city Internet solutions provider, and Dr. Stephen Weber, President of San Diego State University.

Specific Issues

Concern for land-use policy that permits collocation of industrial and residential uses that may not be compatible.

Concern for the preservation of industrial lands, especially for manufacturing.

The City policy to address the issue of radioactive waste disposal will affect businesses in the region, especially in the biomedical industries.

The need for water policies that will ensure an adequate supply of reclaimed water for industrial use.

- The City should direct the Economic Development Division's BEAR Team to continue to work closely with the City of San Diego Fire Department and Bio-safety Directors Committee (Fire / Bio-safety Committee) to streamline regulations impacting the biotechnology industry, and direct them to give a priority to industry concerns when considering collocation of residential development with existing industrial sites.
- The City must resist pressure to convert industrial land to other uses as the region's long-term supply is limited.
- The City Council should formally support siting a permanent location for the disposal of low-level radioactive waste, which could otherwise limit medical research and treatment.
- The City should adopt both customer satisfaction benchmarks as well as benchmarking process performance against other localities that compete for these clusters.

4.4 Regional Perceptions: Science and Technology

Throughout the Forum, participants voiced concern that the City rarely focused attention on the traded technology cluster despite the enormous contribution these firms have to the health of the San Diego economy. Other industries seem to have institutionalized points of access to the City, but the traded technology clusters voiced concern that there are no institutionalized points of access to the City for technology companies through which productive, problem-solving dialogues and partnering between industry and City leaders can take place.

In addition, it was noted that improvement was needed in the creation and maintenance of access to policy makers, legislators, and state, local and federal regulators. It was also stated that there was a lack of voice, visibility and effective connection with key economic and policy centers around the country and the world, specifically, in Washington. It is impressive how much technology innovation occurs in San Diego and how little the rest of the world knows about it.

The bottom line is that the City and region need to understand the importance of science and technology to their future prosperity; they should encourage a voice for leaders from technology industries in local, state and federal policy making and recognize the importance of technology industries in decision-making and budget allocation.

Technology and innovation have diversified San Diego's economy. Once viewed primarily as a tourist location and military community, San Diego has been transformed by the dynamic impact of its technology industries, as well as a resurgence of the defense industry.

Technology industries have not only created high-paying jobs, but they have changed the economics of the entire region by expanding opportunities for all industries within the region. The multiplier effect of the growth of technology industries has therefore rippled throughout the entire San Diego region, raising per capita income in many local clusters.

The economic future of the region depends more on technology industries than on sectors such as sports, tourism and retail upon which the San Diego economy has traditionally relied.

Recommendations to the City of San Diego

- The Mayor and the City Council should utilize the strength of their connections with the state legislature, the governor's office and the federal government on behalf of the interests of the technology clusters that will result in building our local technology economy further, for example, by supporting BRAC and SPAWAR in San Diego and by supporting efforts to raise more money for local research institutions.

- City officials should increase their public support and recognition of the significance of the local technology clusters both locally and nationally; appearances by high level city officials are needed at major technology events and recruiting activities.
- The City should continue to fund economic development efforts specifically oriented towards technology investment in the City through current channels such as the EDC and the C&ED and through new initiatives.

How Can the City Help Gain San Diego Technology Visibility and Support?

“We should enlist Mayor Murphy and the City Council to help us. They have the ability to gain access to the state legislature, the governor’s office, and our federal representatives. They should help us by fighting for R&D – specifically for federal and state money for SDSU and UCSD.

Together, we need to identify earmarks, work with the appropriations committees – and we need to be in the fight early. We need to play hard. As a technology community, we need to work on making San Diego visible in key economic and policy centers around the country and the world. As a result, it will improve San Diego.”

Technology CEO

- In close collaboration, the San Diego Regional EDC and the City’s C&ED should continue to identify and provide economic development assistance to technology companies seeking to locate or expand in San Diego.
- The City should proactively solicit nominations for various board and commissions, in addition to the Mayor's Science and Technology Advisory Commission, from recognized technology CEOs and trade associations that represent the region's technology clusters. Such proactive outreach would strengthen ties between the City's traded industries and political leaders.

The City’s efforts should be redirected to better align the level of city investment in technology growth with the level of the economic impact of the technology clusters. This would be a departure from the City’s current focus on investments designed to promote sports (upgraded and new stadiums) and tourism clusters (tourist promotion and convention center expansions).

5. What the City of San Diego Can Do

Subsequent to the Forum, the Science & Technology Commission has considered ways in which the City of San Diego can be innovative in responding to the needs expressed by technology industries at the Forum.

Traditionally, city governments have focused on infrastructure and regulatory roles, especially in the areas of land use and transportation. These are still important. However, the Forum messages are very clear. The top priorities are recruiting talent, enhancing education, dealing with housing affordability, improving transportation and land use, injecting certainty in the regulatory process, and recognizing the economic contribution of the technology industries to the region. Accordingly, priority roles for the City of San Diego in supporting the growth of the technology industries are:

Support Recruiting, Education and Housing in Addressing the Talent Squeeze

While city government lacks formal authority for local education and workforce development, it can encourage and support business and education leaders in making the growth and retention of talent a top priority. In fact, local government leaders need to join in a partnership with leaders from science, technology and education to launch a comprehensive talent strategy in a multi-pronged, multi-year approach:

- It will require strong industry-education collaboration and targeted improvements in regional education to encourage people to prepare for opportunities in the technology industries. The City can ask top business and education leaders and organizations to work together to help communicate the importance of talent to diverse constituencies, and to offer other support as needed.
- It will require city government to work closely with industry to help address the critical workforce housing challenges that impact the recruitment and retention of talent in technology industries. Whether through an established group like the Affordable Housing Strike Force or a different mechanism that is focused exclusively on mid-level workforce housing, the City should directly involve the science and technology community in addressing this shared challenge.

Engage Science and Technology Industries in Efforts to Address Transportation and Land Use Challenges

City government needs to work closely with industry to create a regional approach to transportation and land use that reduces traffic congestion and its negative impacts on productivity and quality-of-life. Leaders from science and technology industries must be strong partners in existing efforts like the Sorrento Valley Coalition for Traffic Congestion and the Freeway Congestion Strike Team.

Ultimately, the City has substantial responsibility for addressing these issues, but it requires key information and support from the private sector and other stakeholders to be successful. In particular, the practices and preferences of technology firms and their employees must help shape transportation improvements and land use changes.

Because technology companies are often very small businesses, traditional measures such as encouraging car pools or the use of public transit may not be appropriate. Solving this problem will require new and innovative approaches.

Launch a Collaborative Effort to Create a Fast, Effective, and Predictable City Regulatory and Support “System”

City government has clear and direct responsibility for many regulatory standards and processes as well as business support services that impact technology industries. Developing regulatory standards requires input from many stakeholders and careful balancing of interests. However, implementing fast, effective, and predictable regulatory processes that both maintain standards and help businesses stay competitive requires a collaborative approach between city government and industry -- in particular, its technology industries. Even more important is the need to ensure that the wide variety of regulatory processes and business support systems (and the agencies that administer them) fit together cohesively in a fast, effective, and predictable system.

- The City Council should renew its support for the Business and Industry Incentive Program, Council Policy (CP) 900-12. This program serves as the City’s primary economic development platform. Since 1994, CP 900-12 has acknowledged that science and technology industry clusters are economic drivers of the San Diego economy.
- The City Manager should direct the Economic Development Division’s Business Expansion Attraction and Retention (BEAR) Team to continue to work with Development Services and the San Diego Regional EDC in systematically reviewing regulatory processes and business support services that impact the technology industries.
- The City Manager should direct the Economic Development Division’s BEAR Team to continue to work closely with the City of San Diego Fire Department and Bio-safety Directors Committee (Fire / Bio-safety Committee) to streamline regulations impacting the biotechnology industry.
- The City Council can direct the Economic Development Division’s BEAR Team and San Diego Regional EDC to continue to work with technology firms and institutions, other City departments and industry organizations to bring policy recommendations to City Council, its Committees and other City commissions as appropriate. Policy issues such as: 1) collocation; 2) preservation of industrial lands, 3) expanding reclaimed water service delivery, and 4) disposal of radiological waste are examples of current policy issues that impact technology firms and institutions.

Work Together to Promote the Importance of the Technology Industries to San Diego's Economic Prosperity

Working with regional industries, educational institutions, and others, City government has a critical role in making visible the significant contribution of technology clusters to San Diego's economy. Continued funding of promotional programs is a necessary ingredient. Many residents of the region do not understand the connection between the technology clusters and the City's economic prosperity and quality-of-life. Too few residents are preparing for careers in these clusters as growing talent shortages attest. In addition to participating with business leaders in new promotional initiatives both inside and outside the region, the City has a unique local role to play: working with residents, neighborhoods and other constituents to increase awareness of the benefits and opportunities created by local technology industries.

6. Conclusion

The STEP Forum was extremely useful in highlighting the imperatives for continued technology industry growth in the City of San Diego and the San Diego region. The Forum has also generated ideas for new and expanded roles for city government in sustaining the success of the local technology industries in the years ahead.

The Forum called for recognition of the importance of the economic contribution of the technology industries to the future prosperity of the region. It also generated an alert the about the need for local government to invest in the technology industries and to partner with its leaders to address complex challenges for these industries: talent attraction and retention, housing accessibility, effective transportation systems, and regulatory certainty.

Appendix A – STEP Forum Attendees – April 15, 2004

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Appendix B – Opportunities for Civic Entrepreneurs: The Importance of Regional Stewardship

Although not part of STEP Forum recommendations to the City of San Diego, participants discussed ways that they can continue to be involved.

Evidence is widespread – including in San Diego’s history – that the success of a city and region depends on the commitment of its civic entrepreneurs. It depends on the willingness of regional stewards to work together for the long-term well being of their communities. San Diego has profited from its civic entrepreneurship. The history of the birth and growth of UCSD is one example of that kind of commitment to excellence.

More recently, the EDC’s Partnership for the New Economy in 1998 involved over 300 regional stewards, and it developed specific initiatives that were strong catalysts to the development of the UCSD Rady School of Management as well as improvements in transportation, access to capital and K-12 education improvements. These successes were revisited as part of the introduction to the Forum, which was modeled in part on the Partnership for the New Economy.

At the conclusion of the Forum, participants were asked how to initiate civic entrepreneurship to put into action some of the good ideas recommended at the Forum. Several participants offered to volunteer to support initiatives that arose during the Forum discussion, including:

- Create a comprehensive talent strategy that focuses on the preparation, recruitment, retention and transition of the workforce required by growing science and technology clusters.
- Address the challenge of workforce housing as part of a comprehensive talent strategy.
- Promote smart transportation solutions that are linked to housing and land-use alternatives.
- Promote a business/government collaboration that focuses on reforming the regulatory and permitting process.
- Reduce business uncertainty through land use policies that ensure land availability, radioactive waste disposal and the availability of reclaimed water.
- Ensure that science and technology industries are recognized as key engines of economic prosperity and opportunity.